



# *Lycaena helle* in Romania

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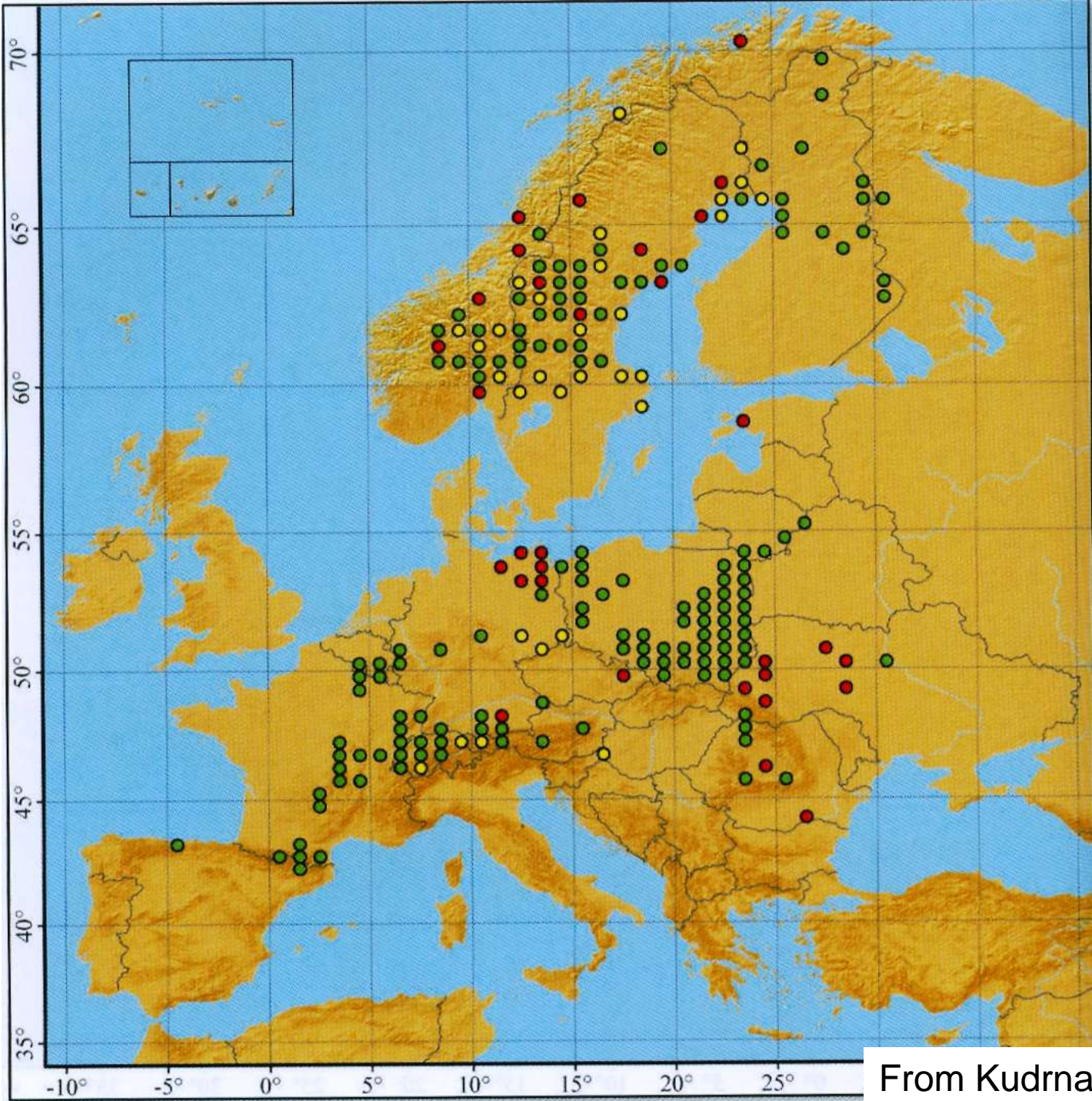
# ***Lycaena helle***

- Glacial relict
  - Restricted to mountain regions (eg. Switzerland, France, Belgium)
  - Moist grasslands
  - Locally extinct in many areas as well as in whole several countries in W and C Europe
- => highly endangered
- Monovoltine in W and C Europe
  - Bivoltine in E Europe

# ***Lycaena helle* in Romania**

- Occurrence at low altitudes (<170m a.s.l., between 150-350 m)
- Inside forests
- Known to occur presently at 2 localities with large populations, in several small populations and locally extinct at three confirmed sites
- Protected by European and Romanian law and Romanian Red List of Butterflies and Moths
- Bivoltine in all known populations
- Distribution area limit – SE Europe





From Kudrna et al. 2011

# Questions

- What are the particularities of the lowland population of *L. helle* and its habitat in Romania?
- Are there nearby other populations and suitable habitats present ?
- What habitat particularities do these populations prefer?
- Is the forest a primary or secondary habitat?





# Methods

Morphological aspects

Population parameters – MRR Method

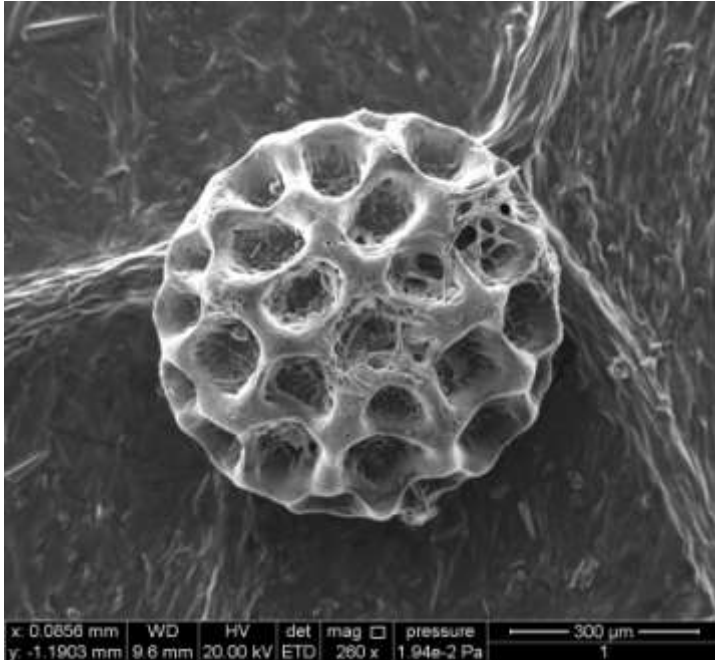
- Size
- Sex structure
- Life span
- Flight distances and patterns
- Flight periods



Other populations

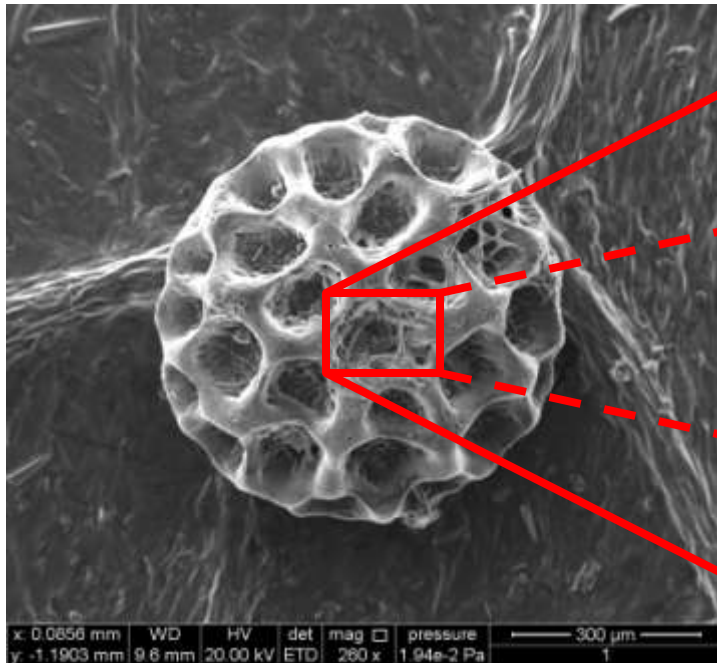
- Mapping of presence/absence data in nearby forest bodies

# Results – Morphology

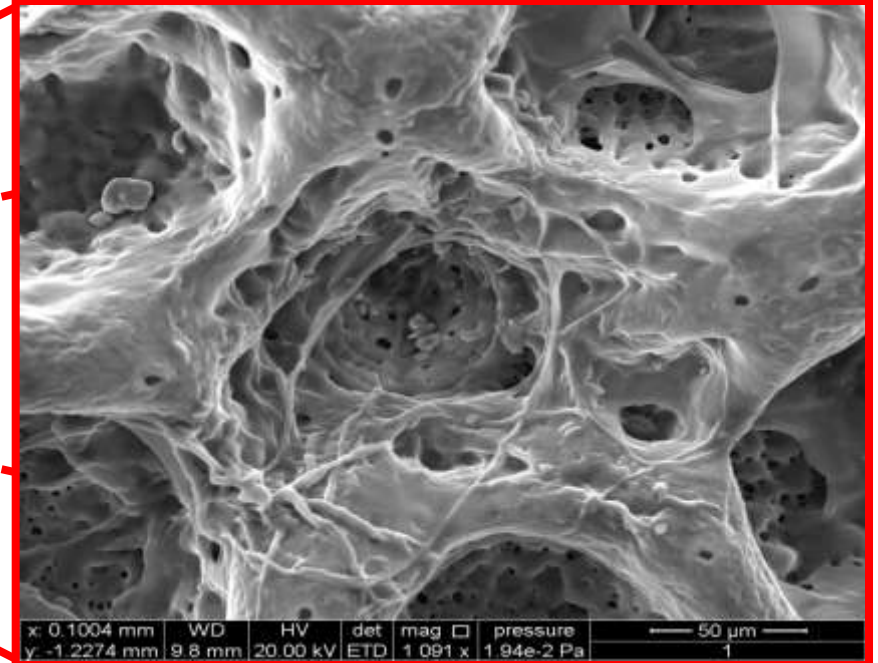


Egg

# Results – Morphology

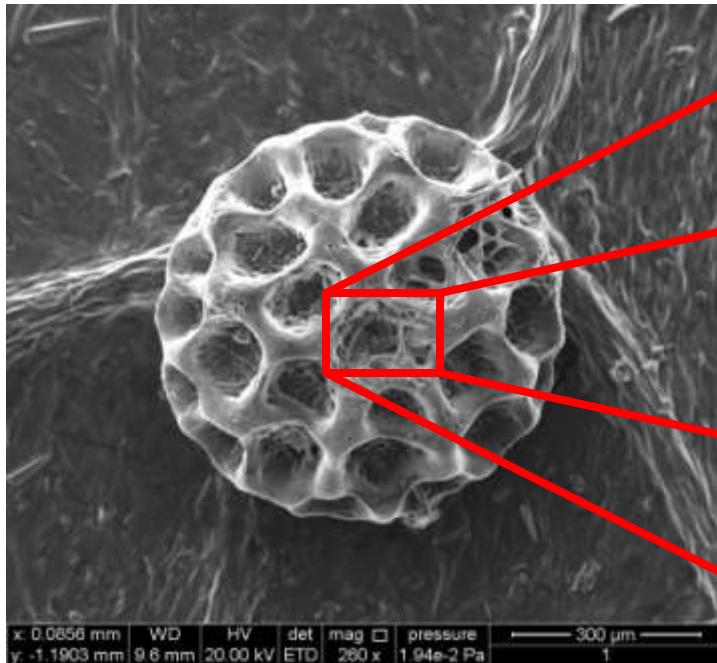


Egg

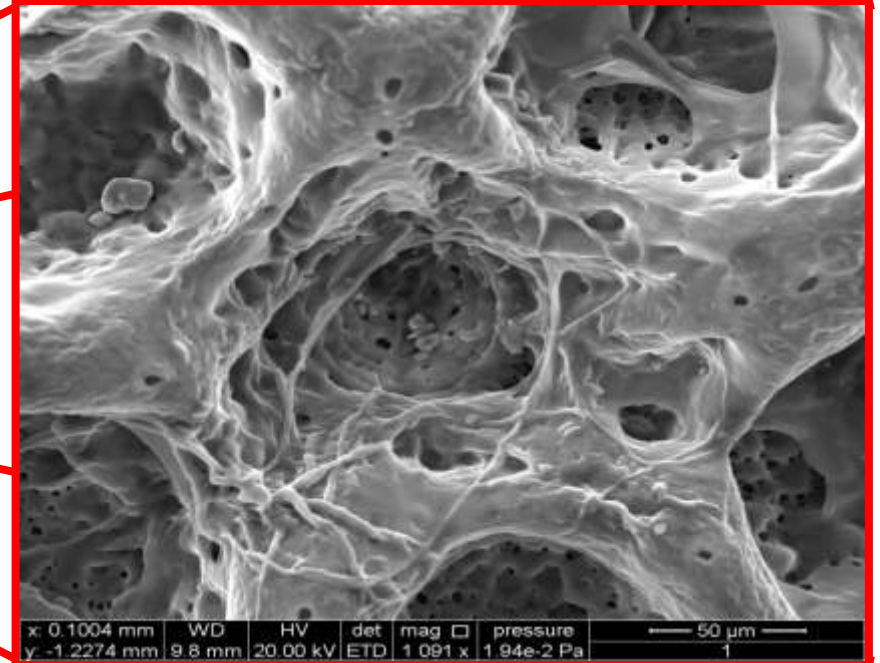




# Results – Morphology

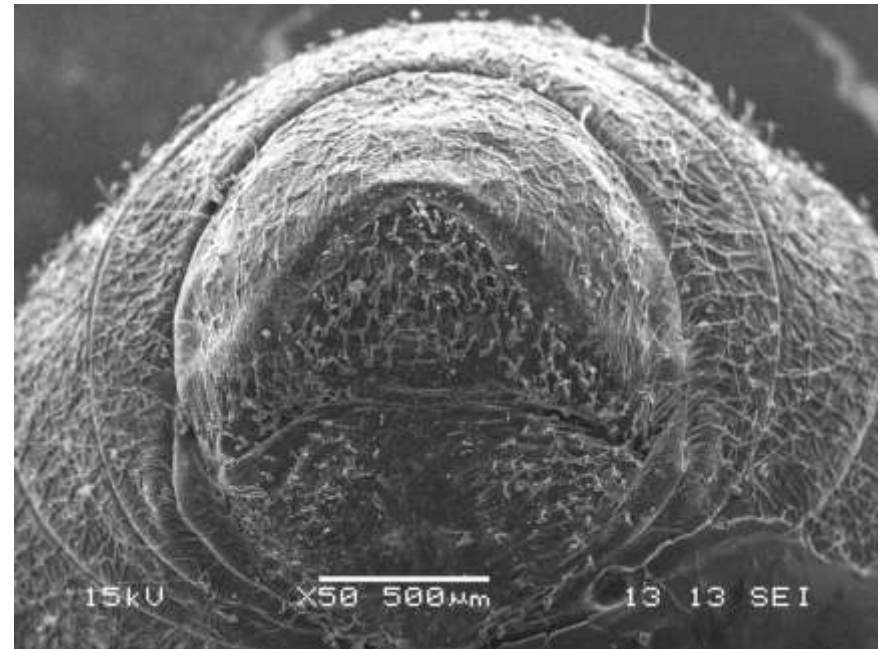


Egg



Larva

# Results – Morphology



Pupa

# Results – Morphology

G1 - males



G1 - females



G2 - male



G2 - female





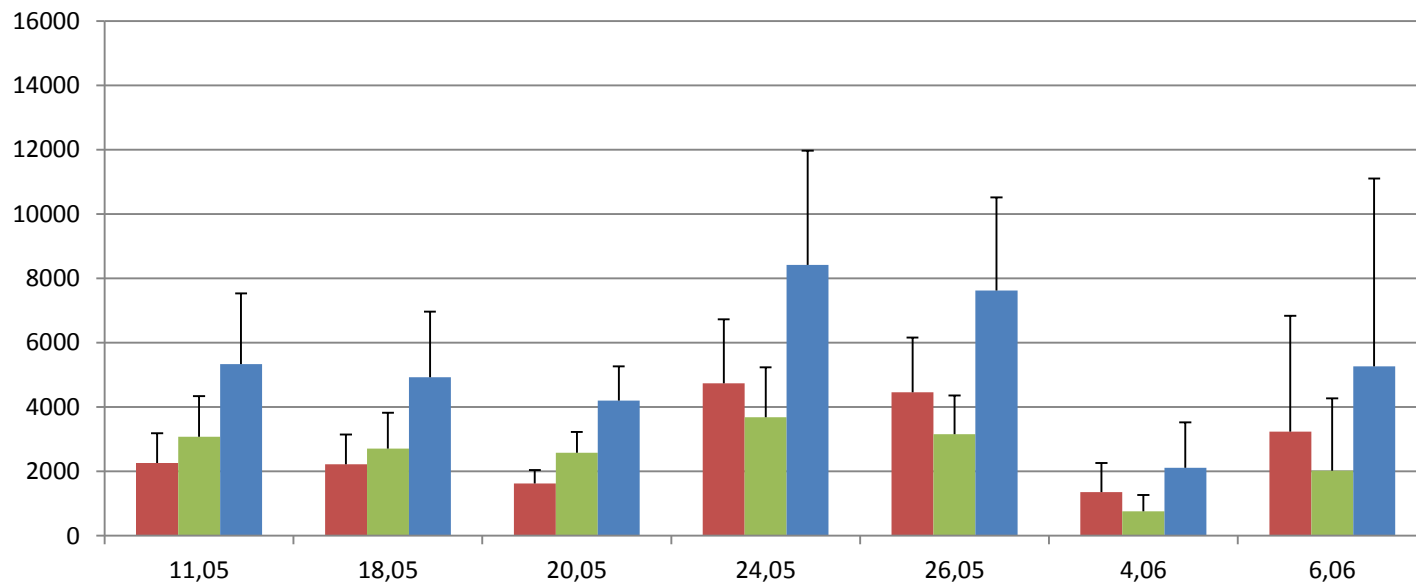
# Results – Population parameters

- G1 – 1637 marked individuals (82 individuals recaptured - 5% recapture rate)
- G2 – 1001 marked individuals (20 individuals recaptured - 2% recapture rate)
- Population estimate in G1 ( $\Phi(.)p(t)$ ):  
**21,019 individuals**
- Population estimate in G2 ( $\Phi(.)p(g)$ ):  
**27,259 individuals**

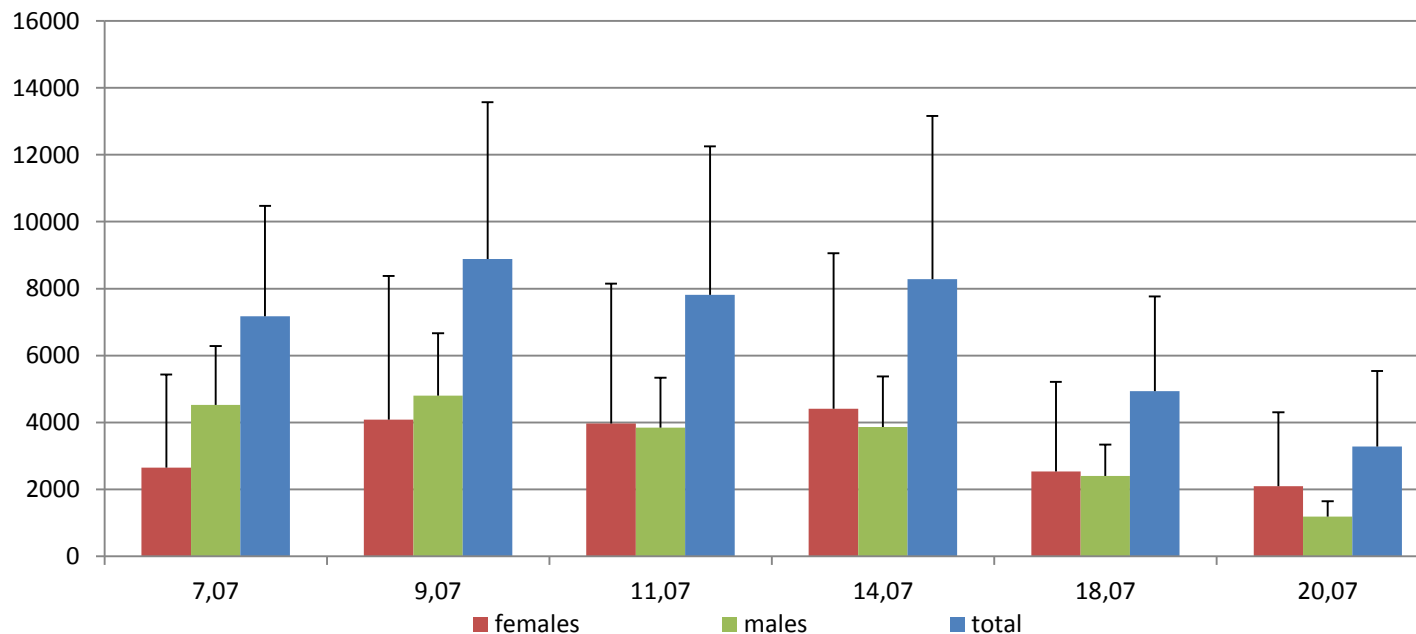


# ***Lycaena helle* population estimates per capture periods in the two generations** **in Satulung (Maramureș County), Romania**

G1



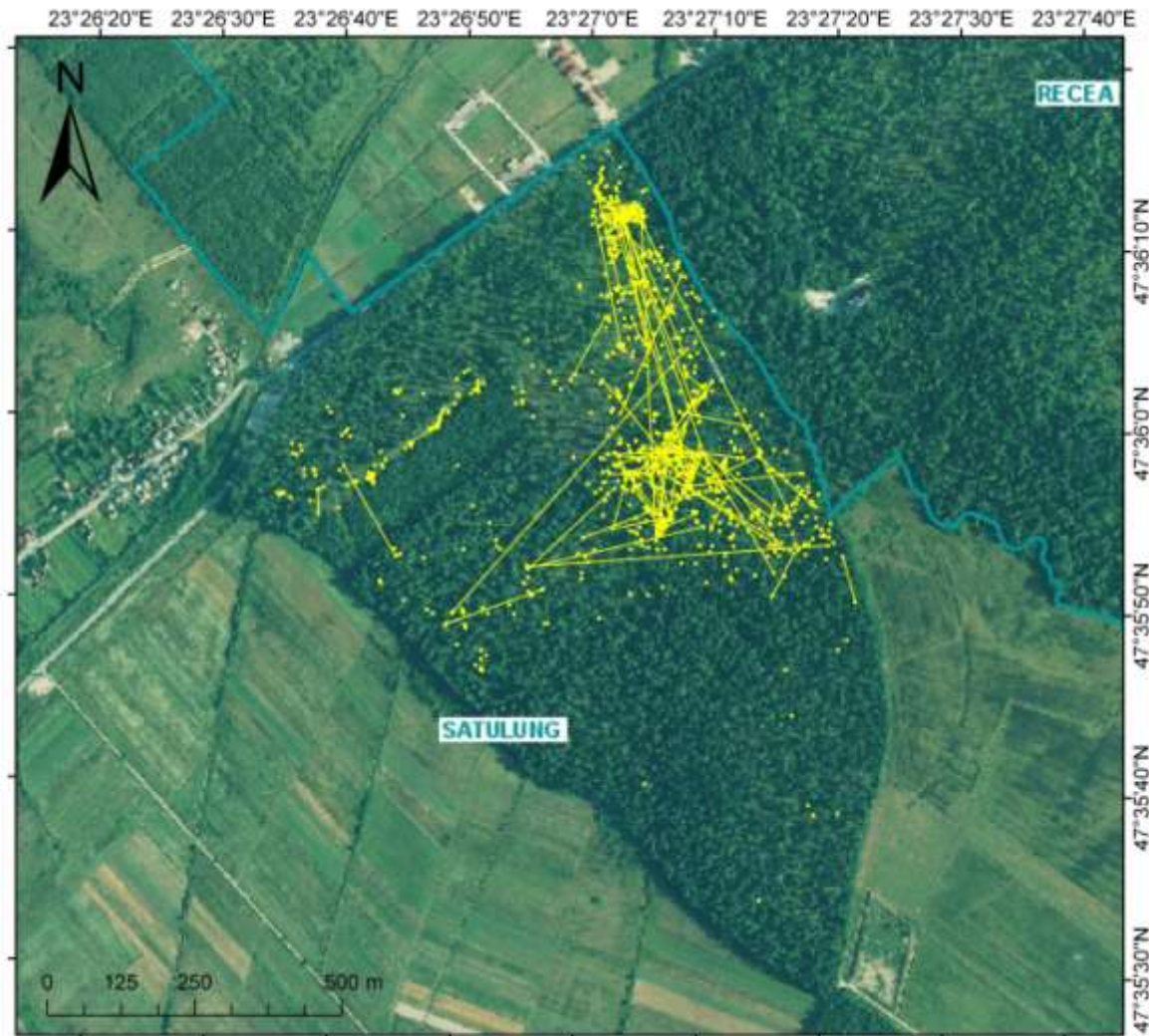
G2



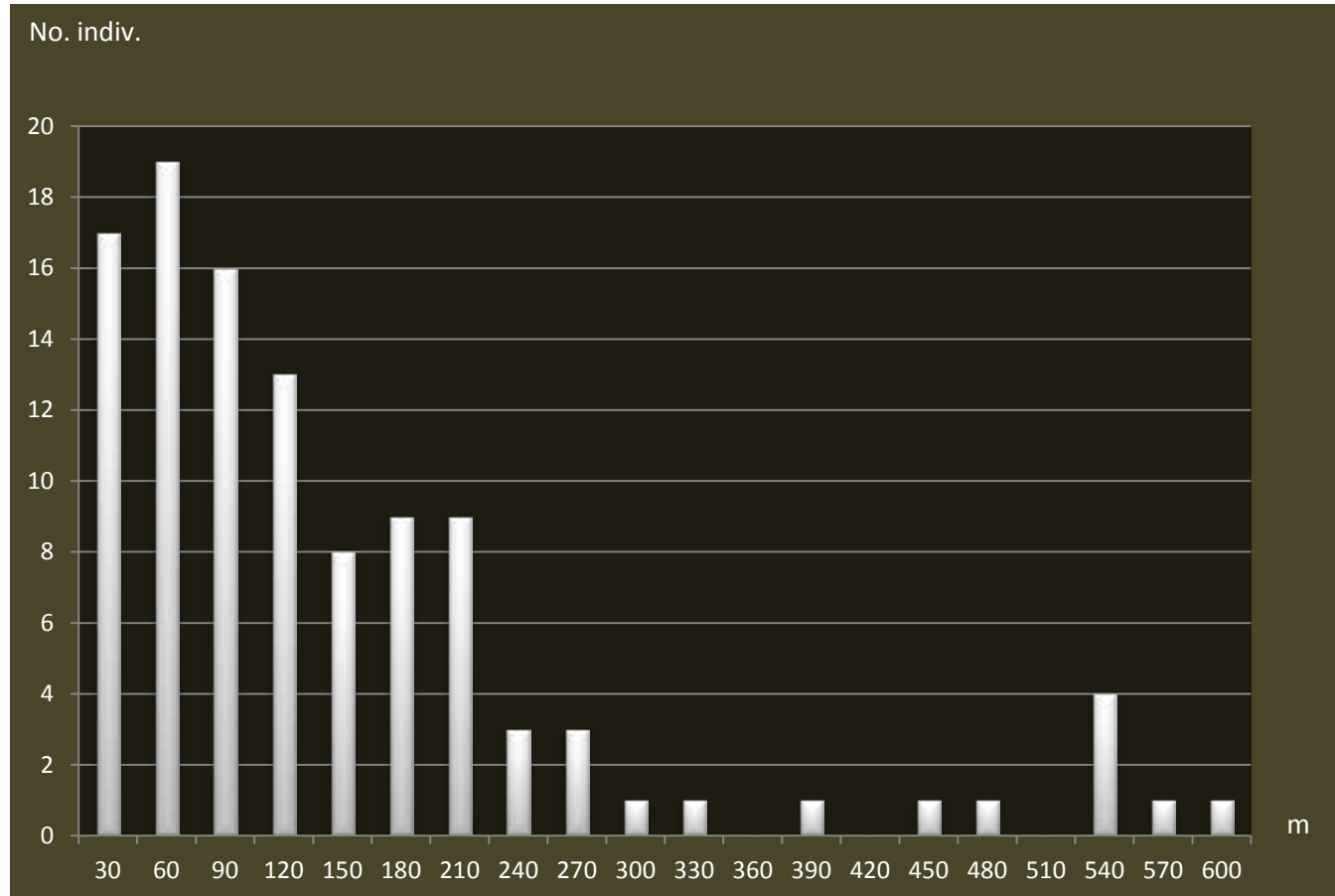
# Recaptures

- Both females and males were recaptured after a mean of 6 days ( $5.8 \pm 6.1$  days females,  $6.1 \pm 5.6$  days males) and after a maximum of 25 days; the individual life span: 8 days in G1 and 3 days in G2
- Mean daily flight distance was:  $39 \pm 49$  m in females and  $56 \pm 96$  m in males, with no significant differences between the two sexes (K-S Test:  $D=0.13$ ,  $p=0.7$ )

- Flight distances between consecutive recaptures: 134 m for females and 135 m for males
- Maximum
  - 589 m for females
  - 516 m for males

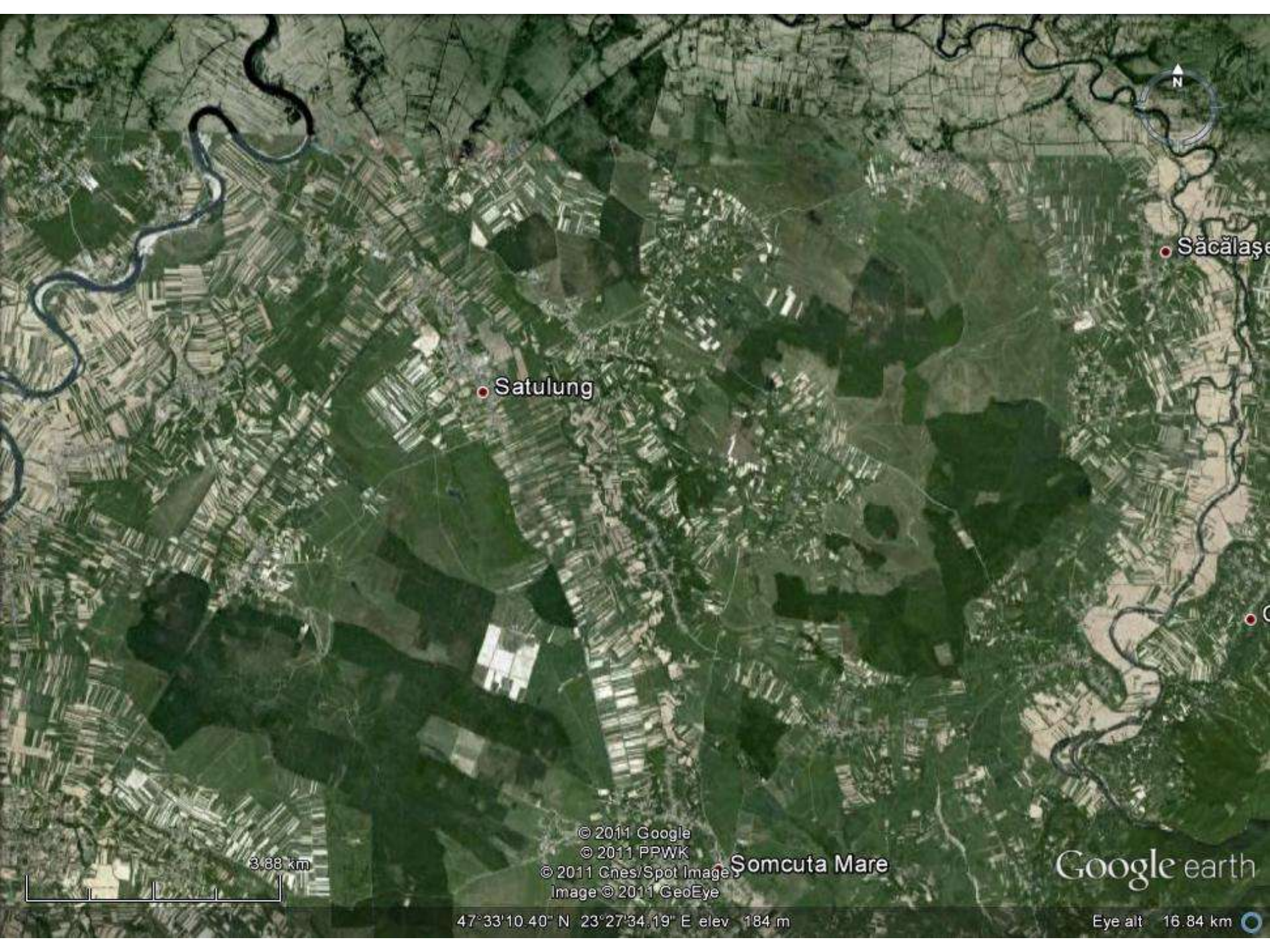


## Between capture flight distance categories for recaptured *L. helle* in Satulung



Over 60% of the recaptured individuals flew under 120m





Săcălașe

Satulung

Somcuta Mare

Google earth

3.88 km

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Image © 2011 GeoEye

47°33'10.40" N 23°27'34.19" E elev 184 m

Eye alt 16.84 km





N

Săcălaș

Satulung

Somcuta Mare

Google earth

3.88 km

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Săcălașe

Satulung

Somcuta Mare

Google earth

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Săcălașe

Satulung

Somcuta Mare

Google earth

3.68 km

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Eye alt 16.84 km



## Preferred habitat structures:

*L. helle* occurs only in the clearings, not in the whole forest



Typical *L. helle* habitat in Satulung, Romania



## Preferred habitat structures:



# Conservation:

The first problem = natural succession of forests leads to closing of the canopy which modifies the structure of the habitat (ground insolation, host plant presence, temperature and soil moisture)

=> extinction risk for the *L. helle* populations

- survival of the populations depends on:
  - Close and accessible patches of suitable habitat (clearings) inside forests => forest management - selective cutting inside of the forest bodies
  - Close patches of host plant (high soil moisture) => prohibiting drainages/ abandoning of roads inside the forest

# Conservation:

The second problem = growing isolation between populations through urbanization and spreading of the arable land

=> no genetic exchange between populations

- survival of the populations depends on:
  - Stepping stone habitats between populations => grassland management through traditional practices (extensive mowing)
  - Preserving patches of host plant in grasslands (high soil moisture) => prohibiting drainages/ heavy machinery/ intensive grazing



# Future plans

- Investigation of genetic diversity and relatedness within Romania and with C and W European populations
- Analysis of dispersal
- Combining population and genetic parameters into PVA
- Developing management strategies for long term survival of the species in Romania

# Aknowledgements

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A photograph of a lush green field filled with numerous purple flowers, likely Salvia, in the foreground. In the background, a dense forest of tall, green trees stands under a clear blue sky. A semi-transparent grey rectangular box is centered over the image, containing the text "Thank you!" in a bold, black, sans-serif font.

**Thank you!**